

## USING THE BLOOM'S REVISED TAXONOMY TO ANALYZE THE TEACHER'S DESCRIPTION OF COGNITIVE SKILLS IN MUSIC COLLEGE'S VOCAL LESSONS

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### ABSTRACT

*The purpose of this study is to analyze how a music teacher describes to develop cognitive skills in Japanese Music College's vocal lessons using the Revised Bloom's Taxonomy by Anderson and Krathwohl (Hereafter the Revised Taxonomy). This is a case study of one vocal teacher's 4-week private lessons. Analyzing the teacher's descriptions of objectives, instructional activities and assessment by the Revised Taxonomy, shed the light of development of cognitive skills in the vocal lessons. Though the Cognitive Process and Knowledge Dimensions of Objectives and Instructional Activities were aligned, those of Assessments were discrepant. The teacher expected the student to Remember and Understand Factual knowledge such as German pronunciation, meaning of lyrics in first lesson. She also expected the student to Understand Conceptual Knowledge and Apply Conceptual and Procedural Knowledge such as skills of singing in accurate German pronunciation with appropriate emotion. Though the teacher assessed the student if she could Evaluate Factual, Conceptual, Procedural and Meta-Cognitive Knowledge and Apply Meta-cognitive Knowledge, it was not written in her descriptions of objective and instructional activities. By applying the Revised Taxonomy to her lesson descriptions, the teacher was successful to be aware of her own teaching process that helped her enhance Meta-cognitive knowledge. Though describing and analyzing music lessons are not easy, the Revised Taxonomy which could reflect teaching in music context can be an effective tool of teacher development.*

**KEYWORDS:** Vocal Lessons, the Revised Bloom's Taxonomy, Cognition, Knowledge

**Received:** Jan 25, 2016; **Accepted:** Jan 30, 2016; **Published:** Feb 03, 2016; **Paper Id.:** IJESRFEB201610

### INTRODUCTION

The most important role of education is to develop cognitive skills which could be transferred to other areas. Cognitive skills are developed in a meaningful context. Without a specific context, it is almost impossible to enhance students' cognitive skills. Everyone has his/her own special interest. If s/he is interested in music, it is a quicker and easier way to develop cognitive skills in music context. Therefore in Music College we should teach cognitive skills in music subjects and lessons. However it is unknown how music teachers teach cognitive skills in their music context. Since most of the music lessons are given privately all over the world, many parts of them are still veiled. The purpose of this study is to investigate how cognitive skills were developed in Japanese Music College's vocal lessons based on the Revised Bloom's Taxonomy by Anderson and Krathwohl (2001).

The two authors of this paper are the colleagues of Japanese Music College. Asako MOTOJIMA is a vocalist and a vocal teacher, whereas Chiharu NAKANISHI is an English teacher and an educational researcher. So far we have collaborated in researching and writing how teachers teach in Music College (2014, 2015, and 2016). This is the fourth paper of our collaboration beyond our specialties.

## BLOOM'S REVISED TAXONOMY

As a framework of analysis, we used the Bloom's Revised Taxonomy (Anderson and Krathwohl, 2001). Bloom's original Taxonomy of educational objectives which was published in the U.S.A. in 1956, influenced designing curriculums, setting educational objectives, and assessing students' achievements inside and outside of the U.S.A. Krathwohl pointed out Bloom's taxonomy could be served as a "common language about learning goals to facilitate communication across persons, subject matter, and grade levels" and "means for determining the congruence of educational objectives, activities, and as assessment in a unit, course, or curriculum" (2002, p.212). In the Revised Taxonomy these points were also succeeded. In the revision of the taxonomy, educational objectives are framed in two dimensions, Cognitive Process Dimension and Knowledge Dimension. The Knowledge Dimension represents terms of some subject matter content. It is the knowledge which students are expected to acquire. In a sentence of objective, the noun refers to the knowledge. Cognitive Process Dimension represents a description of what is to be done with or to that content. In a sentence of objective, the verb generally refers to the intended cognitive process. The Revised Taxonomy is shown (Table 1).

**Table 1: Overview of the Revised Taxonomy Table**

The Knowledge Dimension	The Cognitive Process Dimension					
	1. Remember	2. Understand	3. Apply	4. Analyze	5. Evaluate	6. Create
A. Factual Knowledge						
B. Conceptual Knowledge						
C. Procedural Knowledge						
D. Meta-Cognitive Knowledge						

The Knowledge Dimension has four major types and 10 subtypes (Table 2).

**Table 2: The Knowledge Dimension of the Revised Taxonomy  
(Adapted from Anderson and Krathwohl, 2001, p. 29)**

Major Types	Subtypes
<b>Factual Knowledge</b>	Knowledge of terminology
	Knowledge of specific details and elements
<b>Conceptual Knowledge</b>	Knowledge of classification and categories
	Knowledge of principles and generalization
	Knowledge of theories, models, and structures
<b>Procedural Knowledge</b>	Knowledge of subject-specific skills and algorithms
	Knowledge of subject-specific techniques and methods
	Knowledge of criteria for determining when to use appropriate procedure
<b>Meta-cognitive Knowledge</b>	Strategic knowledge
	Knowledge about cognitive tasks, including appropriate contextual and conditional knowledge
	Self-knowledge

The Cognitive Process Dimension has six categories and 19 subcategories (Table 3).

**Table 3: The Cognitive Process Dimension of the Revised Taxonomy Table**  
(Adapted from Anderson and Krathwohl, 2001, p. 67-68)

<i>Categories</i>	<b>★Definitions and Cognitive Processes Subcategories</b>
<i>Remember</i>	<b>★Retrieve relevant knowledge from long-term memory</b>
	1 Recognizing
	2 Recalling
<i>Understand</i>	<b>★Construct meaning from instructional messages, including oral, written, and graphic communication</b>
	1 Interpreting
	2 Exemplifying
	3 Classifying
	4 Summarizing
	5 Inferring
	6 Comparing
	7 Explaining
<i>Apply</i>	<b>★Carry out or use a procedure in a given situation</b>
	1 Executing
	2 Implementing
<i>Analyze</i>	<b>★Break material into its constituent parts and determine how the parts relate to one another and to an overall structure or purpose</b>
	1 Differentiating
	2 Organizing
	3 Attributing
<i>Evaluate</i>	<b>★Make judgments based on criteria and standards</b>
	1 Checking
	2 Critiquing
<i>Create</i>	<b>★Put elements together to form a coherent or functional whole; reorganize elements into a new pattern or structure</b>
	1 Generating
	2 Planning
	3 Producing

## THE PRESENT STUDY

### Purpose of the Present Study

The purpose of the present study is to investigate how a teacher develops cognitive skills in private vocal music lessons in Japanese Music College. It is placed as a case study and a preliminary study before we explore how vocal teachers develop students' cognitive skills in their Music College's vocal lessons in general.

### Method

#### Participants

One vocal teacher and one vocal student participated in this study. The vocal teacher is the author of this study, Asako MOTOJIMA. She is a vocalist who had experience of teaching voice for 15 years to college students in Music College and adults in Japan. The student was a female vocal major student, a sophomore of Japanese Music College. She had learned voice for about 5 years (3 years in music high school and 1 year and 6 months in Music College). This is the second year for the student to have a lesson by MOTOJIMA. She was a talented student who had big and good quality voice as an alto singer, though her voice wasn't matured yet. In these 1 year and 6 months, the student had learned the head register and color of voice.

Though her sense of pronunciation in German seemed to be weak, the student had been making an effort to improve it.

### **Lesson Description**

This study was conducted in a part of Music College's 4-year private vocal lessons. A lesson is given for 45 minutes every week. In our college one teacher gives vocal lessons to the same student for 4 years. In the present study, 4-week lessons about '*Gretchen am Spinnrade*' by Schubert was focused.

### **Instrument**

The Taxonomy table, the revision of Bloom's taxonomy by Anderson and Krathwohl (2001), was used to classify and analyze the present lessons. Anderson and Krathwohl used the taxonomy table to interpret and analyze the teachers' vignettes in which the teachers described their educational practice.

### **Procedure**

- One of the authors, MOTOJIMA described her 4-week lessons. She wrote down "Objectives, Instructional Activities, and Assessment" of her lessons following the format of teachers' vignette by Anderson and Krathwohl (2001).
- MOTOJIMA gave 4-week private vocal lessons to the student.
- MOTOJIMA and the other author, NAKANISHI collaborated to make a list of 6 Cognitive Process Dimension of the Revised Taxonomy in a vocal lesson context.
- MOTOJIMA and NAKANISHI interpreted and analyzed MOTOJIMA's descriptions and collaborated to write Analysis.

## **ANALYZING VOCAL LESSONS BY BLOOM'S REVISED TAXONOMY**

### **Objectives**

Table 4 is the list of the questions of 6 Cognitive Process Categories in a vocal lesson context. It is used to be criteria to analyze instructional activities.

**Table 4: A List of the Questions in 6 Cognitive Process Categories**

Categories	Example of Learning Questions
<b>Remember</b>	What is "dolce"? What does "dolce" mean?
<b>Understand</b>	Which performance is "dolce"? [comparing] Can you infer how do I (a teacher) make this pronunciation? [inferring]
<b>Apply</b>	(A teacher explains how to sing in "dolce".)
<b>Analyze</b>	Why do you think the composer make this part "dolce"? What is necessary to sing in "dolce"?
<b>Evaluate</b>	Do you think your singing was "dolce"?
<b>Create</b>	If you were the main character of this song, how do you feel? Perform with the feelings of the main charter. What does the composer want to tell in this music? Can you perform while imagining intention of the composer?

From 4.2 to 4.4 are consisted of descriptions by MOTOJIMA and analysis by two authors.

## Objectives

**Table 5: Description and Analysis of Objectives**

Description by MOTOJIMA	Analysis by MOTOJIMA and NAKANISHI
<p>1) The major objective of the four-week unit is that the student will express 'Gretchen am Spinnrade' by Schubert with appropriate emotion in accurate German pronunciation. I would like to guide her to articulate the song not only accurately but emotionally.</p> <p>2) A secondary objective is that the student will learn to understand, interpret and express the dramatism of "Faust" by Johann Wolfgang von Goethe, which influenced Schubert to compose. As 'Gretchen am Spinnrade' is such a difficult and dramatic tune, I will emphasize to teach her structure of music and have her sing as Gretchen.</p>	<p>1) In the major objective, the verb is "express". We categorize this cognitive process as <i>Apply</i>. In music performance, performers are expected to "express" themselves in music. Based on their <i>Remembering</i> and <i>Understanding Factual Knowledge</i>, music performers <i>Apply</i> their <i>Conceptual</i> and <i>Procedural Knowledge</i>. The adjective phrase "with appropriate emotion in accurate German pronunciation" has two main objects. Both objects are related to <i>Factual</i> and <i>Conceptual Knowledge</i>.</p> <p>2) The secondary objective is "to understand, interpret and express the dramatism of "Faust". The verb "understand" means <i>Remember</i> and <i>Understand</i> and "interpret" and "express" are categorized as <i>Understand</i> and <i>Apply</i>. "The dramatism of 'Faust' is <i>Factual</i> and <i>Conceptual Knowledge</i>.</p>

The placement of these two objectives in the cells of the Taxonomy Table is shown in Table 6.

**Table 6: Analysis of Objectives by the Revised Taxonomy**

The Knowledge Dimension	The Cognitive Process Dimension					
	1. Remember	2. Understand	3. Apply	4. Analyze	5. Evaluate	6. Create
A. Factual Knowledge	Objective 1, 2	Objective 1, 2				
B. Conceptual Knowledge		Objective 1, 2	Objective 1, 2			
C. Procedural Knowledge			Objective 1, 2			
D. Meta-Cognitive Knowledge						

## Instructional Activities

**Table 7: Description and Analysis of Instructional Activities**

	Description by MOTOJIMA	Analysis by MOTOJIMA and NAKANISHI
1 <sup>st</sup> week	<p>1) I focused on pronunciation of German. As it was the second year for the student to learn German, to correct her pronunciation such as umlaut Ü(ü), and Consonants T, P and M, was essential.</p> <p>2) I taught her articulation of high notes, and gave her some tips of how to get the round and soft sound with vibrations, using the soft palate, the diaphragm and keeping low balance. 3) I showed her how to sing with my performance and then she followed me right away.</p>	<p>1) The verbs are "correct, give and show, sing". The student was expected to <i>Remember</i> and <i>Understand German Pronunciation</i> which is <i>Factual knowledge</i>.</p> <p>2) The student was expected to <i>Understand Factual knowledge</i> first. Then she was expected to <i>Apply Conceptual Knowledge</i> to pronounce.</p> <p>3) The teacher showed her how to sing and copy the performance. Since the teacher did not explain how to sing, the student was expected to <i>Apply Conceptual Knowledge</i> to sing.</p>

2 <sup>nd</sup> week	<p>1) I began my lesson by reviewing pronunciation and sound of head register.</p> <p>2) Then I asked a few questions about “Faust”. (eg. Who was Faust? What was the storyline?) 3) We also discussed Gretchen as a person. (eg. How did she look like? How did she live? How was her character? Why was she confused so much? What would happen in the end?)</p> <p>4) Through discussing them, I wanted her to imagine how Gretchen felt.</p> <p>5) Finally I explained about the role of piano part. I described that the piano represented ‘a spinning wheel’ and it helped to express emotion of <i>Gretchen</i>. Therefore a pianist had also very important role as the same as a singer. That is very remarkable not only in Schubert’s song but also other German Lieder songs.</p>	<p>1) “Reviewing” may mean the teacher “check” the student’s understanding. It means that the student was expected to <i>Remember Factual Knowledge</i>.</p> <p>2) The detail of Faust was asked. Therefore, the student was expected to <i>Remember Factual knowledge</i>.</p> <p>3) The detail of ‘Gretchen’ was asked. The student was expected to <i>Remember Factual knowledge</i>.</p> <p>4) The student was expected to imagine how ‘Gretchen’ felt. It means that the student was expected to <i>Understand Conceptual knowledge</i>.</p> <p>5) The student was expected to <i>Remember Factual knowledge and Understand Conceptual knowledge</i>.</p>
3 <sup>rd</sup> week	<p>1) I began my lesson reviewing pronunciation, lyrics, and sound of 1<sup>st</sup> and 2<sup>nd</sup> week.</p> <p>2) I showed the stream of ‘<i>Gretchen am Spinnrade</i>’ to the student and explained the organization of it.</p> <p>3) I taught there were three parts in this song and where the climax came.</p> <p>4) Then I told her that she should not sing too loud or show too much emotion from the beginning.</p> <p>5) The student was asked to read aloud the lyrics and played a part of <i>Gretchen</i> using all what she had learned.</p>	<p>1) “Reviewing” means to <i>Remember Factual Knowledge</i>.</p> <p>2)3) The verb was “explain” and the teacher gave new information. The student was expected to <i>Understand Factual knowledge</i>.</p> <p>4) The student was expected to <i>Remember Factual knowledge and Understand Conceptual Knowledge</i>.</p> <p>5) The student was expected to <i>Apply Conceptual knowledge</i>.</p>
4 <sup>th</sup> week	<p>1) The student was expected to sing by heart. She had to sing as <i>Gretchen</i>.</p> <p>2) She was asked if she could overview the structure of the whole tune and dramatism.</p>	<p>1) The student was expected to <i>Remember Factual knowledge and Apply Conceptual Knowledge</i> to have a heart of Gretchen.</p> <p>2) The student was expected to <i>Remember Factual knowledge</i>.</p>

Table 8: Analysis of Instructional Activities by the Revised Taxonomy

The Knowledge Dimension	The Cognitive Process Dimension					
	1. Remember	2. Understand	3. Apply	4. Analyze	5. Evaluate	6. Create
A. Factual Knowledge	1 <sup>st</sup> , 2 <sup>nd</sup> , 3 <sup>rd</sup> , 4 <sup>th</sup> week	3 <sup>rd</sup> week				
B. Conceptual Knowledge		1 <sup>st</sup> , 2 <sup>nd</sup> week	3 <sup>rd</sup> week			
C. Procedural Knowledge			1 <sup>st</sup> week			
D. Meta-Cognitive Knowledge						

## Assessment

Table 9: Description and Analysis of Assessment

Description by MOTOJIMA	Analysis by MOTOJIMA and NAKANISHI
<p>I assessed my student during and at the end of 4-week lessons:</p> <p>1) if she could perform by heart accurately in the lyrics, sound, tune, dynamics, vocalization, and pronunciation.</p> <p>2) if she could apply what she has learned such as</p>	<p>1)2) The student was assessed if she could <i>Remember Factual Knowledge</i></p> <p>3) The student was assessed if she could <i>Remember Factual Knowledge and Apply Procedural Knowledge</i>.</p> <p>4) The student was assessed if she could <i>Understand</i></p>

pronunciation and articulation. 3) if she could sing in legato 4) if she could observe the musical structure while singing 5) if she could understand the dramatic background and express her emotion with vivid imagination 6) if she could evaluate herself in all parts of her singing	<i>Factual Knowledge</i> and <i>Apply Procedural Knowledge</i> . 5) The student was assessed if she could <i>Understand Factual Knowledge</i> and <i>Apply and Create Conceptual Knowledge</i> . 6) The student was expected to self- <i>Evaluate</i> her singing and evaluate <i>Meta-cognitive Knowledge</i> in all parts of her singing.
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**Table 10: Analysis of Assessment by the Bloom's Revised Taxonomy**

The Knowledge Dimension	The Cognitive Process Dimension					
	1. Remember	2. Understand	3. Apply	4. Analyze	5. Evaluate	6. Create
<b>A. Factual Knowledge</b>	Assessment 1)2)3)	Assessment 4)5)			Assessment 6)	
<b>B. Conceptual Knowledge</b>			Assessment 5)		Assessment 6)	Assessment 5)
<b>C. Procedural Knowledge</b>			Assessment 3)4)		Assessment 6)	
<b>D. Meta-Cognitive Knowledge</b>			Assessment 6)		Assessment 6)	

## CONCLUSIONS AND PEDAGOGICAL IMPLICATIONS

Placing the teacher's descriptions of "Objectives, Activities, and Assessments" into cells by the Revised Taxonomy made clear the teacher's expectation and the discrepancies between descriptions and practice. The cells of Objective and Instructional Activities were coincided. The teacher expected the student to *Remember* and *Understand Factual Knowledge* such as German pronunciation, meaning of lyrics in first lesson and *Apply Conceptual* and *Procedural Knowledge* in their performance. These *Knowledge* and *Cognitive Dimensions* of Instructional Activities and those of Objectives are aligned. According to the teacher's descriptions, she did not expect the student to develop cognitive skills of *Analyze*, *Evaluate*, and *Create*. The teacher explained that as the student was a beginner of German and weak in pronunciation, she did not expect much in the Cognitive Process Dimension of *Analyze*, *Evaluate*, and *Create*.

The cells of Assessment and those of Objectives and Instructional Activities did not align. Though the teacher assessed if the student could *Evaluate* her *Factual*, *Conceptual*, *Procedural* and *Meta-Cognitive Knowledge* and if she could *Apply Conceptual*, *Procedural* and *Meta-cognitive Knowledge*, it was not written in her description of Objectives and Instructional Activities. The teacher explained that she had emphasized to improve Meta-Cognitive Knowledge which is very important in the performance of singing. She told that describing and practicing teaching were two different things. The teacher mentions when she describes her new vignette for her lesson, she can think about alignment of Objectives, Instructional activities, and Assessment. By applying the Revised Taxonomy to her lesson descriptions, the teacher was successful to be aware of her own teaching process that helped her enhance *Meta-cognitive knowledge*.

This experimental study shows that it is not easy to use the Revised Taxonomy in music context. Unlike academic subject context, the verbs which the present vocal teacher used are not varied. They are limited to "pronounce, articulate, express, show, and express". It might be weakness or unskillfulness of the teacher, but it might be the music specific phenomenon. The nouns which represent Knowledge in music context are varied more. As we cannot find better or more useful framework to analyze cognitive process dimensions, we will keep using the Revised Taxonomy for the next research in music context to suggest a way to use it.

Though describing and analyzing music lessons are not easy, using the Revised Taxonomy to reflect teaching can be an effective tool of teacher development. We would like to examine the effectiveness and limit of the Revised Taxonomy for FD purpose in our future study.

## ACKNOWLEDGEMENTS

This paper is based on the presentation at HKICEPS, 2015 The 4th Hong Kong International Conference on Education, Psychology and Society. The work was supported by Grants-in-Aid for Scientific Research, Grant Number 25350294, awarded by Japan Society for the Promotion of Science.

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